

Toth et al.

Serial No. 10/065,450

REMARKS

Claims 18-30 and 38-56 are pending in the present application. In the Office Action mailed February 24, 2005, the Examiner rejected claims 18-24, 29-30, 38-40, 42, and 53-56 under 35 U.S.C. §102(b) as being anticipated by Toth et al. (USP 6,115,487). The Examiner next rejected claims 28 and 41 under 35 U.S.C. §103(a) as being unpatentable over Toth et al. Claim 25-27, 43-46, and 50-52 were rejected under 35 U.S.C. §103(a) as being unpatentable over Toth et al., and further in view of Yamada (US 2002/0071600 A1). Applicant appreciates the Examiner's indication that claims 47-49 are allowable.

Applicant likewise appreciates the indication that the remarks presented November 16, 2004 were persuasive and that the rejections previously presented under 35 U.S.C. §112 have been withdrawn.

Applicant has amended claim 48 to delete the term "helical". Thus, Applicant believes that the informality objected to by the Examiner has been corrected.

Claims 18-24, 29-30, 38-40, 42, and 53-56 stand rejected under 35 U.S.C. §102(b) as being anticipated by Toth et al. The Examiner asserted that the "computerized method" disclosed in Toth et al. anticipates the computer readable medium of claim 18 and the method of claim 38. Applicant respectfully disagrees.

Toth et al. discloses a correction algorithm for bone-induced spectral artifacts in computed tomography imaging. Specifically, Toth et al. teaches "a spectral correction algorithm for correcting dense object-induced spectral artifacts." Abstract. In accordance with this correction algorithm, Toth et al. discloses that two separate acquisitions are carried out to reconstruct two separate images. See col. 1, ln. 67 – col. 2, 4. That is, a calibration object is scanned and data acquired therefrom is reconstructed to provide an image. Id. A water or water-equivalent cylinder is also scanned and reconstructed for the same display field-of-view (DFOV) as the calibration object image. Id. A ratio of the calibration object image to the water cylinder image is then evaluated and "a region of interest extracted by multiplying the ratio by a function $\Pi(r)$, to obtain a calibration pattern CP." Col. 4, lns. 14-15. From this calibration pattern, a calibration vector is obtained. See col. 4, lns. 36-37. A circularly symmetric image pattern is determined and subtracted from the calibration object image "to provide a substantially artifact free image." Col. 4, lns. 65-67. Toth et al. also teaches that the correction technique may be carried out for an arbitrary head scan and, thus, a head image rather than a calibration image is reconstructed, and subsequently processed in accordance with that described above. See col. 5,

Toth et al.

Serial No. 10/065,450

Ins. 1-8. In any event, two separate scans are carried out, two images reconstructed, and an artifact free image presented.

The claimed invention, however, is directed to a technique whereby an artifact index (AI) is determined from isolating or partitioning pixels of an image. That is, with the claimed invention, as defined by claims 18 and 38, pixels of a single image are segmented or partitioned into a first set and a second set, one of the sets is set to an initial value, an AI is determined, and then displayed on a console. There are a number of distinctions between the claimed invention and that disclosed by Toth et al.

For example, Toth et al. teaches the scanning of two objects and the reconstruction of two separate images. A ratio of the images is evaluated and used to determine a calibration factor. In contrast to that which is claimed, pixels within a single image are not segmented into separate sets for subsequent evaluation. Also, Toth et al. does not teach the determination of an AI. The Examiner has concluded that the calibration error vector disclosed by Toth et al. is equivalent to the claimed AI. However, the reference does not support such a conclusion.

The "calibration error vector CEV" is representative of the circularly symmetric image error introduced by non-corrected bone-induced artifacts. See col. 4, Ins. 55-60. Toth et al. teaches determination of a vector indicative of actual image error due to bone-induced artifacts. In fact, Toth et al. teaches that a "circularly symmetric image error pattern" can be generated "and subtracted from the calibration image, to provide a substantially artifact free image." Col. 4, Ins. 64-67. In contrast, the present application defines the AI as a measurement indicative of the likelihood of artifact presence in a reconstructed image from data acquired with a given set of scan parameters. See Application, ¶29. That is, an AI is a value indicative of anticipated artifact presence for a given scan. It is not a measurement of actual artifact presence.

Furthermore, Toth et al. neither teaches nor suggests displaying of an AI on a console. Toth et al. teaches a calibration error vector that is used to generate an image error pattern that can be subtracted from a calibration image to reconstruct an artifact-free image. See col. 4, Ins. 64-67. While Applicant does not believe that the calibration error vector or the image error pattern qualifies as an AI; nevertheless, assuming they do, Toth et al. fails to not teach that the calibration error vector or the image error pattern is ever displayed. All that is displayed is a reconstructed image. See Id.

Accordingly, Applicant respectfully believes that called for in claims 18 and 38 is patentably distinct from that taught and/or suggested by the art of record. Nevertheless, Applicant has amended claims 18 and 38 to be in better condition for appeal. Applicant has also

Toth et al.

Serial No. 10/065,450

amended claim 56 to be consistent with amendment to claim 38. It is believed that the amendments neither affect the scope nor the subject matter of the claimed invention. The amendments are presented to improve readability and understanding of that which is claimed. Entry thereof is appreciated.

Regarding the rejection of claims 25-28, 41, 43-46, and 50-52 under 35 U.S.C. §103(a), Applicant respectfully disagrees with the Examiner with respect to the art as applied, but in light of claims 25-28, 41, 43-46, and 50-52 depending from otherwise allowable claims, Applicant does not believe additional remarks are necessary and, therefore, requests allowance of claims 25-28, 41, 43-46, and 50-52 at least pursuant to the chain of dependency.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 18-30 and 38-56.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,



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Dated: March 24, 2005
Attorney Docket No.: GEMS8081.138

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